1/3/06

MEMORANDUM FOR: Roger Lamoni
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National Weather Service, Western Region

FROM: Jim Prange
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SUBJECT: 2005 Annual Fire Weather Report

The following report is an evaluation of fire weather products and services provided by Seattle WFO to Western Washington land management agencies during the 2005 fire season. This report includes verification statistics for Fire Weather Watches, Red Flag Warnings, and NFDRS zone trend forecasts; the number of spot forecasts issued; the number of IMET dispatches with the number of days out of the office; and detailed information on fire weather teaching assignments and liaison activities.

Weather Synopsis:

Weather conditions during the 2005 fire season were extremely conducive to high fire danger in Western Washington with Fire Danger Indices reaching historically high values from August through late September. After a dry winter with historic low snow pack levels in the Olympics and Cascades, conditions turned wetter than normal in March and continued into mid-July. Actually western Washington experienced two green-up cycles in the light fuels, which accounted for much of the high fire danger through the summer. An abnormally wet period from late September through early October brought western Washington's 2005 fire season to an end.

Fire Weather Watch/Red Flag Warning Verification:

Red Flag Warnings are verified using lightning data, RAWS data, NFDRS observations, and other local observational networks. Red Flag events in the Seattle fire weather district west of the Cascade crest consist of dry lightning or strong, east winds combined with low relative humidity. East of the Cascade crest in Fire Weather Zone 662, Red Flag events consist of dry lightning or strong westerly winds combined with low relative humidity. Watches and warnings for these events are issued when the observed fire danger, as described by the Energy Release Component (ERC), is equal to or above the 90^{th} percentile in the historical distribution of ERC's.

There were **0** Red Flag Warnings or Fire Weather Watches issued for the Seattle fire weather district during the 2005 Fire Season. A few episodes of dry lightning did occur, but they were isolated in coverage and did not meet the scattered coverage criteria. No lightning outbreaks occurred after extended dry periods. There were a few weak to moderate east wind events in the Olympics and Cascades through the summer. However, none reached required wind speeds or duration for Red Flag Warnings to be issued. All the lightning and east wind events were headlined in the Fire Weather Planning Forecast.

Fire Weather Watch for Dry Thunderstorms - 0 issued
Fire Weather Watch for East Wind Events - 0 issued
Fire Weather Watch for West Wind Events - 0 issued
Average lead-time on Fire Weather Watches - NA

Red Flag Warnings for Dry Thunderstorms - 0 issued
Red Flag Warnings for East Wind Events - 0 issued
Red Flag warnings for West Wind Events - 0 issued
Average lead-time on Red Flag Warnings - NA

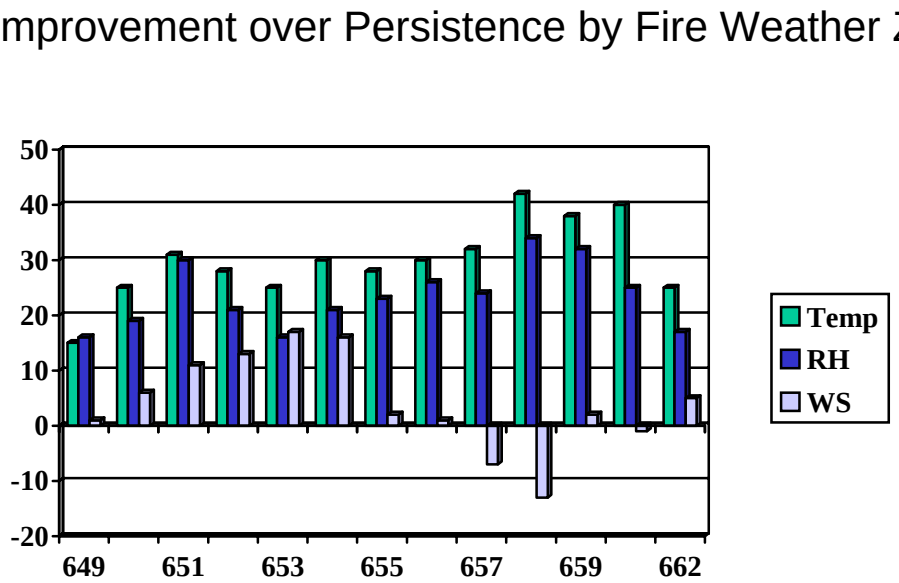
Of Red Flag Warnings issued = a + c = Dry TRW = 0, East Winds = 0, West Winds = 0
Of Red Flag Warnings that verified = a = Dry TRW = NA, East Winds = NA, West Winds = NA
Of Red Flag Warnings that did not verify = c = Dry TRW = NA, East Winds = NA, West Winds = NA
Of Red Flag events with no warning issued = b = Dry TRW = 0, East Winds = 0, West Winds = 0

POD = a/(a+b) = Dry TRW = N/A, East Winds = N/A, West Winds = N/A
FAR = 1 - (a/(a+c)) = Dry TRW = N/A, East Winds = N/A, West Winds = N/A
CSI = a/(a+b+c) = Dry TRW = N/A, East Winds = N/A, West Winds = N/A

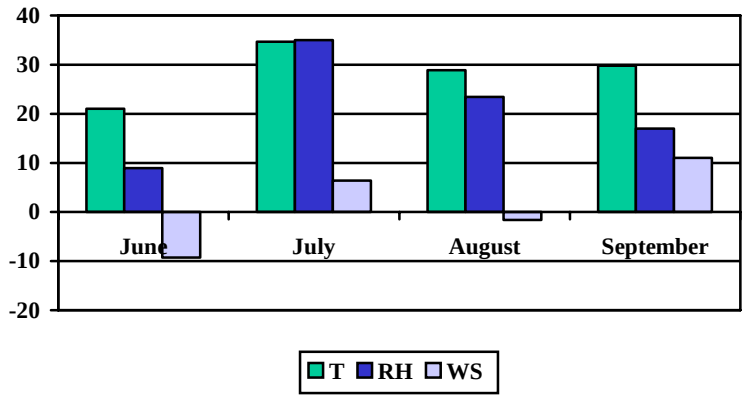
NFDRS Verification:

NFDRS forecast verification was accomplished by comparing the average forecast values derived from the 2 p.m. zone trend forecasts, with the 2 p.m. NFDRS Fire Weather Zone observation averages for the following day. While not the most accurate method of verifying NFDRS forecasts, it is the best method available at the present time. Numerous problems of poor quality data, missing data, or late-arriving data continue to hinder forecast verification procedures and performance. Verification statistics were calculated using the same set or group of stations that was used in previous years. Comparisons are then made with the overall results.

In 2005, Seattle showed a **30.0%** improvement over persistence in temperature forecasts, a **23.5%** improvement over persistence in relative humidity forecasts, and a **4.2%** improvement over persistence in wind speed forecasts. The MOU forecast goals are **35%** improvement for temperature, **25%** improvement for relative humidity, and **10%** improvement for wind speed. Because of the narrow range in possible winds speeds, compared with the possible range in temperature and relative humidity, it continues to be very difficult to show large improvement over persistence in wind speed. NFDRS verification continued to be plagued at times with an absence of lowland NFDRS observations over weekends. These were caused primarily by WIMS and Gateway problems not by the agencies manually putting in the 2 pm NFDRS observations. Observations were also much more continuous in the sense that the same observation site or the number of observations did appeared in each Fire Weather Zone each day compared to the last two years.

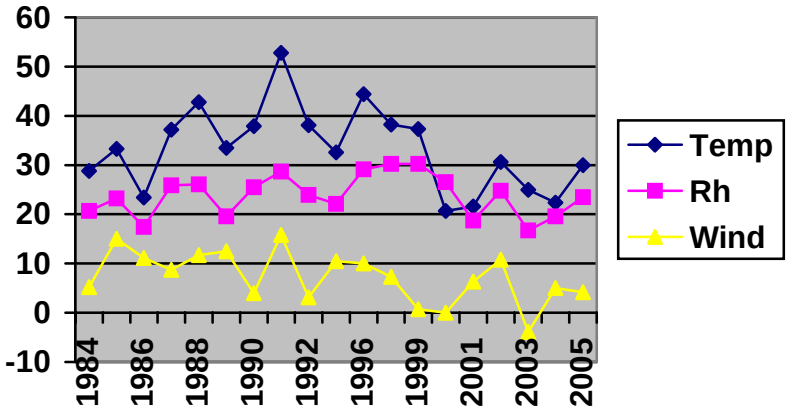


2005 % Improvement over Persistence by Month



Yearly Zone Average Verification												
Temperature					Relative Humidity				Wind Speed			
Year		MAF(f)	MAE(p)	%IMPV		MAE(f)	MAE(p)	%IMPV		MAE(f)	MAE(p)	%IMPV
1984		3.7	5.2	28.8		8.8	11.1	20.7		1.8	1.9	5.2
1985		3.2	4.8	33.3		8.6	11.2	23.2		1.7	2.0	15.0
1986		3.6	4.7	23.4		9.0	10.9	17.4		1.6	1.8	11.1
1987		3.4	5.4	37.2		8.0	10.8	25.9		1.5	1.7	8.7
1988		3.2	5.6	42.8		8.2	11.1	26.1		1.7	1.7	11.7
1989		3.2	4.8	33.5		8.5	10.6	19.6		1.5	1.7	12.5
1990		3.3	5.4`	37.9		8.5	11.5	25.5		1.4	1.5	4.0
1991		3.3	5.7	52.8		8.2	11.5	28.7		1.6	1.9	15.8
1992		3.2	5.1	38.1		9.0	11.8	23.9		1.5	1.6	3.1
1995		3.3	4.9	32.6		8.8	11.3	22.1		1.7	1.9	10.5
1996		3.0	5.4	44.4		7.8	11.0	29.1		1.8	2.0	10.0
1998		3.4	5.5	38.2		8.1	11.6	30.2		1.6	1.6	0.7
1999		3.8	6.1	37.3		9.0	12.9	30.3		1.5	1.5	0.7
2000		3.6	5.2	30.7		8.6	11.7	26.5		1.6	1.6	0.0
2001		3.5	4.4	21.6		8.1	10.0	18.7		1.6	1.8	6.3
2002		3.4	4.9	30.6		8.0	10.7	24.8		1.7	1.9	10.8
2003		4.1	5.5	25.0		9.2	11.3	16.7		1.9	1.9	-3.9
2004		3.8	4.9	22.4		9.2	11.5	19.6		1.6	1.8	5.0
2005		3.8	5.4	30.0		9.5	12.6	23.5		1.5	1.6	4.2

NFDRS Trend Verification



2005 Spot Forecasts:

Seattle issued **39** spot forecasts this past season. The majority of requests were made using the Internet spot forecast request form. Each spot forecast was in support of a search and rescue missions, prescribed burns and wildfire support during the 2005 fire season. By category: **10** for were issued for wildland fire support, **26** for prescribed burning support, **2** for Search and Rescue(SAR) support and **1** for HAZMAT support.

2005 IMET Dispatches

In 2005, a total of **41** days were spent in on-site IMET support of HAZMAT and wildland fire support activities. The table below lists the assignments.

Dates	IMET	Location	Wildfire
1/14-27/05	Prange	Dutch harbor, AK	M/V Selendang Ayu HAZMAT Support (14 Days)
8/15-29/05	Haner	Agnes, OR	Blossom Complex (15 Days)
8/29-9/10	Prange	Riggins, ID	Granite WFU Complex (12 Days)

Training and Liaison Activities in 2005:

There were a total out of **59** office days spent in 2005 in support of fire weather training and/or liaison activities. The table below lists the assignments. (**465** student Fire Fighters trained, over **1000** participants at fire weather related outreach/liaison activities)

Date	Forecaster	Location	Activity
2/5-6	Prange, Haner	Sequim, WA	S-290 (22 Students)
2/11	Prange	Portland, OR	Semi-Annual GACC Mtg
3/2	Haner, Cerniglia	Renton, WA	King Co. EOC Drill
3/9	Prange, Haner	Central Cascades	RAWS/Fuels Inspection

3/14	**Haner**	**Ft. Lewis, WA**	**S-190 (14 Students)**
3/14-18	**Prange**	**Redmond, OR**	**S-490 (55 Students)**
3/23	**Prange, Hill, Buehner**	**Seattle, WA**	**Fire Weather Users Conf (28 Participants)**
4/9	**Prange**	**Mt. Erie, Wa**	**FWX Refresher Training (15 Crew Members)**
4/19-20	**Prange, Haner**	**Bellevue, WA**	**Partners in Preparedness Conf (550 Attendees)**
4/21	**Prange**	**Bonney lake, WA**	**East Pierce Co. Fire S-290 (15 Students)**
4/26	**Prange, Buehner**	**Camp Murray, WA**	**Washington State EOC TFX (20 Participants)**
4/29	**Prange, Haner, Hill, Buehner, Colman**	**Seattle, Wa**	**NOAA Open House (150 Attendees)**
4/30	**Prange**	**Mt. Erie, WA**	**FWX Refresher Training (12 Crew Members)**
4/30-5/1	**Haner**	**Yakima, WA**	**S-290 (30 Students)**
5/3-5	**Cerniglia**	**Chehalis, WA**	**S-390 Student**
5/5	**Prange**	**Port Angeles, WA**	**Clallam Co. Fire Chief's Seminar (28 Participants)**
5/12	**Prange**	**Baker Lake, WA**	**Baker River IHC FWX Refresher Training (20 Crew Members)**
5/15-16	**Prange**	**Mt. Erie, WA**	**S-190 Guard School (24 Students)**
5/16-19	**Prange, Haner**	**Everett, WA**	**S-290 (28 Students)**
5/23	**Prange**	**Darrington, WA**	**S-190 (15 Students)**
5/26-27	**Prange**	**Redmond, OR**	**Satellite Training (10 Participants)**
5/28	**Prange**	**Maple Valley, WA**	**Maple Valley Radio Club (19 Participants)**
6/14	**Prange**	**Port Angeles, WA**	**ONP FWX Refresher Training (56 Crew Members)**
6/20	**Prange**	**Ocean Shores, WA**	**S-190 (18 Students)**
6/21	**Prange**	**Port Angeles, WA**	**S-190 (96 Students)**
6/21	**Haner**	**Roy, WA**	**S-190 (25 Students)**
6/24	**Prange**	**Tacoma, WA**	**S-290 (11 Students)**
6/28	**Haner**	**Roy, WA**	**S-190 Guard School (9 Students)**
6/29	**Buehner, Prange**	**Wenatchee, WA**	**State Fire Chief's Mtg (160 Participants)**
6/29	**Buehner, Prange**	**Seattle, WA**	**Season Outlook King Co ECC (28 Participants)**
6/30	**Buehner, Prange**	**Seattle, WA**	**Annual FWX Media Tour (~25 media representatives)**